

REMARKS

Claims 1-22 are pending in the present application. However, claims 4, 9-11, 15, and 20-22 are withdrawn from consideration following an election/restriction requirement. Accordingly, only claims 1-3, 5-8, 12-14 and 16-19 are under consideration. Claims 1 and 12 are the only independent claims.

In the Office Action, claims 1-3, 8, 12-14, and 19 are rejected under 35 U.S.C. 103(a) as obvious over WO 02/38933 to Harndorf et al. ("Harndorf"), which corresponds to US 7,017,337 to Plote ("Plote") in view of US 6,666,019 to Kawatani et al. ("Kawatani").

Further, claims 5-6 and 16-17 are rejected under 35 U.S.C. 103(a) as obvious over Harndorf in view of Kawatani and further in view of US 4,655,037 to Rao ("Rao").

Reconsideration and withdrawal of the rejection is respectfully requested.

As acknowledged in the Office Action, Harndorf/Plote does not determine a maximum duration for application of post-injection.

Further, it is submitted that, contrary to the assertion in the Office Action, the selection of the method that specifies a **predetermined maximum duration** for the application of post-injection in the system and method of Harndorf et al. would **not** have been within the level of ordinary skill in the art.

Plote is completely silent regarding defining a maximum duration for post-injections in certain regeneration conditions. Specifically, Harndorf/Plote stops regeneration, not as a function of a "predetermined maximum duration," but as a function of a threshold value for the pressure differential in the particulate filter, and that the threshold of Plote may be varied depending on the

operating state of the engine, but there is no suggestion that a maximum duration could be set for the regeneration.

In contrast, defining a maximum duration for post-injections in certain regeneration conditions, as recited in the present claims, has significantly advantages as a security measure to ensure the quality of regenerations. In particular, the “maximum duration” of the presently claimed invention makes it possible to optimize effective post-injections as a function of low exhaust temperatures and to reduce oil dilution, by progressively reducing the post-injections as soon as the duration of post-injection utilization has reached the predetermined maximum duration of application during this stage of idling, as recited in present claim 1.

For example, if the conditions dramatically change during the course of a regeneration, such as when the engine is put in idling position, there is some fuel injection into the cylinders but with a very small quantity of fuel.

According to the presently claimed invention, the post-injections (e.g., the fuel dedicated to the DPF regeneration) may continue as long as they are considered appropriate so that the regeneration may be fully carried out.

However, the combustion conditions in the cylinders during idling are such that post-treatment temperature may be reduced up to a point where blue smokes may occur. In addition, post injection when the engine idles increases the risk of oil dilution.

The present inventor has found that, nevertheless, post-injections may still be performed during said idling or no combustion period, provided said period is limited in time and provided the quantity of fuel injected during said post injection varies with a temperature decrease.

Clearly, if idling occurs for a long period of time, for example, the regeneration should be stopped irrespective of the clogging state.

In this respect, the presently claimed invention, as recited in present claims 1 and 12, provides for (a) responding to the temperature acquired downstream from the oxidation catalyst to determine a **maximum duration** for the application of post-injections during a stage of idling; and (b) progressively reducing the post-injections as soon as the duration of post-injection utilization has reached **the predetermined maximum duration** of application during this stage of idling.

These features of the presently claimed invention are very different from Harndorf/Plote, which simply mentions that, depending on the running conditions, the regeneration may be longer or quicker. Namely, Harndorf/Plote does not address at all with the situation where, during the course of a regeneration, the conditions change due to the engine idling.

Further, Kawatani fails to remedy the deficiencies of Harndorf/Plote. Specifically, Kawatani focuses on optimizing the timing of the post-injection, meaning the time during the cycle when the post injection occurs (see, e.g., Kawatani at Figure 2). However, Kawatani is completely silent regarding the duration of a period of performing post-injections.

In summary, the features of the presently claimed invention and their advantages are not taught or suggested in the cited references. Therefore, the present claims are not obvious over the cited references taken alone or in any combination.

Request for reconsideration
U.S. Appl. No.: **10/595,635**
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In addition, with respect to the dependent claims, it is submitted that the cited references fail to teach or suggest the combined features of each of these claims. Therefore, each of these respective claims is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

Conclusion

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

/nicolas seckel/

Nicolas E. Seckel
Attorney for Applicants
Registration No. 44,373

Nicolas E. Seckel
Patent Attorney
1250 Connecticut Avenue, NW Suite 700
Washington, DC 20036
Tel: 202-669-5169
Fax: 202-822-1257
Customer No.: 29980
NES/rep